

# Installation Manual

VSS-1616-02-x

Multiple Channel Video Selector

Document # 540290



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## **VSS-1616-02-x**

### **Multiple Channel Video Selector**

#### **1.0 General Information**

##### **1.1 Introduction**

This manual contains information for the proper installation of the Audio International, Inc. (AI) Multiple Channel Video Selector, Model No: VSS-1616-02-x. The “-x” in the suffix denotes the type of connector utilized; “-01” = Positronic and “-2” = D-Subminiature. Also included are physical and electrical characteristics of the unit.

##### **1.2 Purpose of the Equipment**

Audio International's VSS-1616-02-x is a multi-channel cabin video source selector. The module has 16 independent differential composite video source inputs and 16 composite independent video outputs. Any video source input may be routed to any video source output, and all outputs are capable of providing output for the same single video input source concurrently. Each video output is capable of driving most CRT and LCD displays. Output gain 1:1.

The VSS-1616-02-x has a video briefer input for video briefing. Any input can be configured as the briefer source by using setup software during initial installation. Initialization software can also be used to determine the power-up defaults for each output.

For communication interface purposes, the VSS-1616-02-x communicates over the RS-485 serial data bus interface. Strapping ID pins located on the unit can be used to allow up to eight (8) identical units to exist on the same data bus segment by providing a method for which each unit may be individually addressed.

One (1) discrete ground input is used to provide control of video briefer activation to the unit.

### 1.3 Optional Equipment

Audio International, Inc. offers a comprehensive family of Cabin Control Modules. These modules provide convenient solutions for a variety of frequently encountered interfacing needs or special requirements and are an important part of AI's "building block" system for configuring total cabin management.

Contact your AI representative for details.

## 2.0 Application

### 2.1 Video Input (Analog)

Typical interfaces include various types of video source equipment. This unit is capable of interfacing and accepting input from all Audio International and standard COTS (Commercial-Off-The-Shelf) video source equipment including but not limited to: Camcorder, Live-Feed Camera, DVD, VCP and VCR players as well as Moving Map Systems and Personal Game Systems.

### 2.2 Video Output (Analog)

Typical interfaces include various video distribution and/or signal manipulation devices. This unit is capable of interfacing and providing output to all Audio International and standard COTS (Commercial-Off-The-Shelf) video devices and/or equipment including but not limited to: Video Crosspoint Distribution Modules (i.e., A/V-9691, AV-3232), LCD display monitors, Plasma display monitors, Projectors, Personal Display Devices and Touch Screen ECU Modules.

### 2.3 Discrete Interfaces

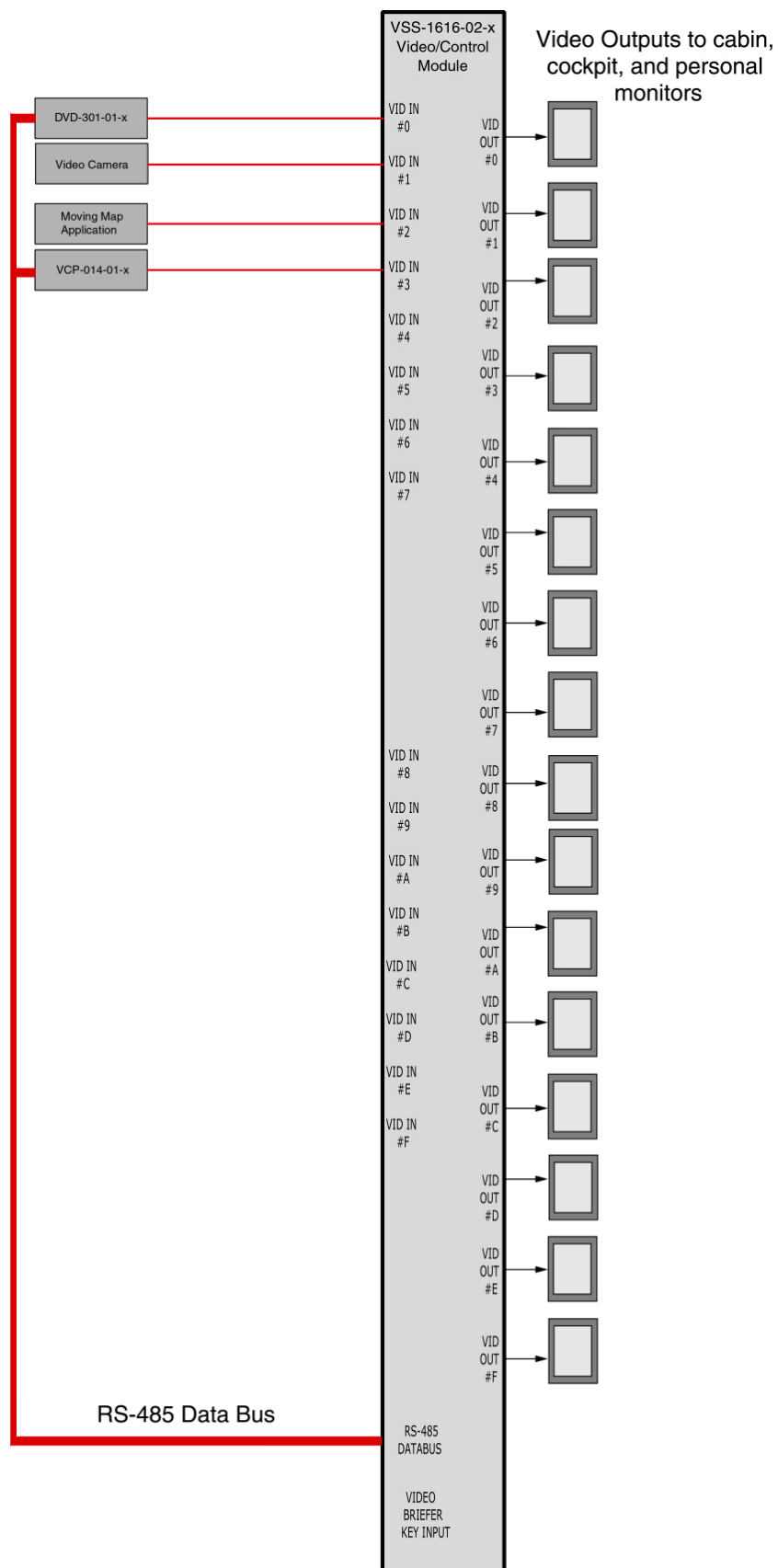
The VSS-1616-02-x has one (1) discrete interface used for video briefer control.

Pin number	Active state	Inactive state
J1-9	Ground Only ( $\leq +0.3$ VDC)	Open

### 2.4 Unit ID Strapping

This unit incorporates three (3) ID strapping connections to allow up to eight (8) like units to operate concurrently on the same RS-485 serial data bus segment independently of each other.

## 2.5 Block Diagram – Typical Application



### 3.0 Installation

#### 3.1 Prior to Installation the following items should be considered:

3.1.1 During the design and layout of the aircraft cabin, careful consideration of the location of this module is necessary. Some of the items to be considered include:

- Space
- Available power supply
- Environmental conditions (temperature, humidity, etc.)
- Length of cable runs
- Location of other aircraft systems
- Access for service repair
- Convenience for user interface

3.1.2 The VSS-1616-02-x shall be installed to conform to the standards designated by the customer, installing agency, and existing conditions as to the unit location and type of installation.

3.1.3 Mounting screws are required to secure the unit. Refer to Section 6.0, Reference Drawings, for mounting hole diameters and configuration.

#### 3.2 Unpacking and Inspection

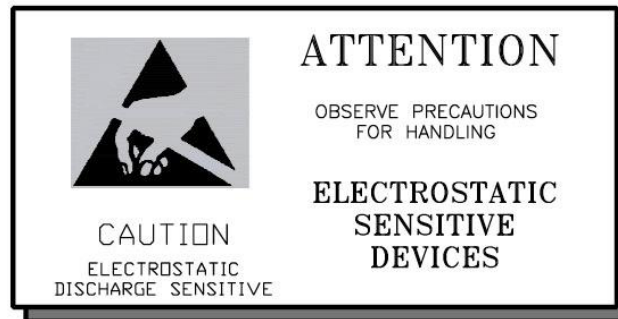
3.2.1 Carefully open the packaging and remove the VSS-1616-02-x. Verify that all components have been included in the package per the packing list. Inspect the unit for damage. Retain the packing materials and packing list.

3.2.2 If damage has occurred during shipping, a claim should be filed with Audio International WITHIN 24 hours and a **Return Request Authorization Number** shall be obtained from AI by contacting the Repair Department at 501.801.0640. Repackage the unit in its original packaging materials and return it to AI following instructions given by the AI representative. Refer to the front cover of this manual for address. If no return is necessary, retain the packing list and the packing materials for storage.

#### 3.3 *Cautions and Warnings*

3.3.1 It is important to do a pin-to-pin power and ground check on all connectors. Ensure that power and ground are applied only where specified. Damage to the unit may result if power or ground is applied to the wrong points.

- 3.3.2 **DO NOT** connect or disconnect the monitor while power is applied.
- 3.3.3 **DO NOT** remove any factory-installed screws. Damage to the units may result and void any warranties.
- 3.3.4 **NO** scheduled maintenance is required to ensure continued airworthiness.
- 3.3.5 The chassis material and structural design of this unit is such that the unit is capable of containing fire within the unit. However, the unit does **not** provide for waterproof operation.
- 3.3.6 Active power application to the unit is **not** recommended. This unit requires input power to be inactive before making connections to unit for proper operation.
- 3.3.7 **ESD** (Electro Static Discharge) guidelines shall be followed.



## 3.4 Wiring Requirements

### 3.4.1 Introduction

The installing agency shall supply and fabricate all external cables and mating connectors. The length and routing of external cables should be carefully studied and planned before attempting installation of the equipment. Allow adequate space for installation of cable and connectors. Avoid sharp bends and placing cables near aircraft control cables. Maintain a minimum clearance of three (3) inches from any control cable. If wiring is run parallel to combustible fluid or oxygen lines, maintain a separation of six (6) inches between the lines.



### 3.4.2 Power Wires

Audio International recommends that power and ground wires be 22 AWG minimum. The chassis shall be electrically bonded to the airframe structure by a conductive mounting point with  $<0.1 \Omega$  resistance using  $<50 \Omega$  impedance cable. Aluminum wool, nylon webbing impregnated with aluminum oxide abrasive or fiber bristle brushes are the approved tools for removing anodized surfaces at mounting point where the bonding wire is attached. Power and Ground wires shall be in accordance with **NEMA WC 27500** or equivalent. Protect power wires with circuit breakers or fuses located close to the electrical power source bus.

### 3.4.3 Video Lines

Composite video connections shall be shielded coaxial cable in accordance with **M17/94-RG179** or equivalent.

### 3.4.4 RS-485 Serial Data Bus

The VSS-1616-02-x is designed to interface with other Audio International equipment via AI's proprietary RS-485 serial data bus. The data bus shall be implemented using a twisted shielded pair cable in accordance with **NEMA WC 27500** or equivalent. The wire size for the conductors in this cable shall be 22 AWG, MINIMUM. Shield pins are available for connecting data bus shields when required.

Refer to AI document 650007 for RS-485 Serial Data Bus design architecture.

### 3.5 Physical Characteristics

3.5.1 Refer to Section 5.0 for unit dimensions.

3.5.2 Refer to Section 6.0 for attachment points.

3.5.3 Mounting provisions are provided via four (4) 0.15" diameter mounting holes – two (2) on each the left and right sides of unit on provided mounting flanges. When mounting the unit, allow sufficient space for mating connectors.

3.5.4 Chassis material is brushed 5052-H32 aluminum sheet metal with a black anodized finish per **MIL-A-8625** to provide proper corrosion protection.

3.5.5 This unit is capable of being mounted in any orientation whether horizontal, vertical, inverted, or at an angle.

3.5.6 This unit is capable of intended operation with no internal cooling fan air circulation and no ventilation holes in the chassis. Additionally, this unit does not require external direct air cooling for proper operation provided it is mounted with access to ambient cabin air exchange. Installation recommendation requires 1" spacing from other components and structures except the mounting surface for which the unit should be in direct contact. Installation location should provide a minimum air-space volume around installed unit of four (4) cubic inches.

### 3.6 Electrical Characteristics

<b>Electrical</b>	Nominal Current Draw	750 mA @ +28 VDC
	Maximum Current Draw	1.5 A @ +28 VDC
	Operating Range	+18 to +32 VDC
<b>Video</b>	16 Video Inputs	75 $\Omega$ , 1 V(p-p) Composite
	16 Video Outputs	75 $\Omega$ , Gain = 1, Composite

### 3.7 Mating Connector Information

The unit individual connector designations and mating connector part numbers are described in this section. For each connector designation, pin number assignments and interface descriptions are identified and described accordingly.

All wiring harnesses to the unit shall be supplied and fabricated by the installing agency.

<b>J1</b>	
<b>PART NUMBER</b>	<b>MATING CONNECTOR</b>
VSS-1616-02-1	RD9F10JVL0 or equivalent (Positronic Industries)
VSS-1616-02-2	DEMA-9S or equivalent (ITT Cannon)

<b>J2</b>	
<b>PART NUMBER</b>	<b>MATING CONNECTOR</b>
VSS-1616-02-1	CBD8W8F00Z00 Female Plug FCC4102D Female Contact (x8) or equivalent (Positronic Industries)
VSS-1616-02-2	DCMM8W8S Female Plug D53742-1 Female Contact (x8) or equivalent (ITT Cannon)

<b>J3</b>	
<b>PART NUMBER</b>	<b>MATING CONNECTOR</b>
VSS-1616-02-1	CBD8W8M00Z00 Male Plug MCC4102D Male Contact (x8) or equivalent (Positronic Industries)
VSS-1616-02-2	DCMM8W8P Male Plug DM53740-1 Male Contact (x8) or equivalent (ITT Cannon)

<b>J4</b>	
<b>PART NUMBER</b>	<b>MATING CONNECTOR</b>
VSS-1616-02-1	CBD8W8F00Z00 Female Plug FCC4102D Female Contact (x8) or equivalent (Positronic Industries)
VSS-1616-02-2	DCMM8W8S Female Plug D53742-1 Female Contact (x8) or equivalent (ITT Cannon)

<b>J5</b>	
<b>PART NUMBER</b>	<b>MATING CONNECTOR</b>
VSS-1616-02-1	CBD8W8M00Z00 Male Plug MCC4102D Male Contact (x8) or equivalent (Positronic Industries)
VSS-1616-02-2	DCMM8W8P Male Plug DM53740-1 Male Contact (x8) or equivalent (ITT Cannon)

## 3.8 Pinout Assignment Descriptions

J1		J2	
Pin #	Description	Pin #	Description
1	+28 VDC Power Input	A1	Video Input 0
2	Ground	A2	Video Input 1
3	Data Bus A (HI)	A3	Video Input 2
4	Data Bus B (LO)	A4	Video Input 3
5	Data Bus Shield	A5	Video Input 4
6	Unit ID 0	A6	Video Input 5
7	Unit ID 1	A7	Video Input 6
8	Unit ID 2	A8	Video Input 7
9	Video Briefer Key Input		

J3		J4	
Pin #	Description	Pin #	Description
A8	Video Output 0	A1	Video Input 8
A7	Video Output 1	A2	Video Input 9
A6	Video Output 2	A3	Video Input A
A5	Video Output 3	A4	Video Input B
A4	Video Output 4	A5	Video Input C
A3	Video Output 5	A6	Video Input D
A2	Video Output 6	A7	Video Input E
A1	Video Output 7	A8	Video Input F

J5	
Pin #	Description
A8	Video Output 8
A7	Video Output 9
A6	Video Output A
A5	Video Output B
A4	Video Output C
A3	Video Output D
A2	Video Output E
A1	Video Output F

### 3.9 Post-Installation Test

- 3.9.1 Verify source equipment has been loaded with clean, undamaged material and that all display monitors are properly connected and ready for viewing.
- 3.9.2 Verify that +28 VDC power has been properly connected to the VSS-1616-02-x.
- 3.9.3 Play selected source material and ensure that the material can be viewed on the appropriate monitor.
- 3.9.4 To ensure proper functionality of the unit, **all** pieces of source equipment inputting to the VSS-1616-02-x, and **all** monitors receiving output from the VSS-1616-02-x should be tested.

## 4.0 Troubleshooting

### 4.1 General Troubleshooting Procedures

- Verify +28 VDC power is applied to the proper pins on all the units. Use a voltmeter to verify correct level.
- Reset unit(s) by removing power for at least one (1) minute.
- Recheck all connections for security and all harness runs for possible pinching. Recheck all pinouts for application accuracy.
- Should difficulties arise in the installation of the unit, contact Audio International, Inc. Product Support, for assistance.

### 4.2 Instructions for Continued Airworthiness

No periodic scheduled maintenance or calibration is required for continued airworthiness of the VSS-1616-02-x Multiple Channel Video Selector. If the unit fails to perform to specifications, it must be removed and serviced by a qualified service facility.

## 5.0 Specifications

Physical Specifications	
Housing	Aluminum
Weight	Approx. 1.2 lb / 0.5 kg
Dimensions* (l x w x h)	3.2" x 7.8" x 2.1" 8.1 cm x 19.8 cm x 5.3 cm

\* All dimensions are given with tolerances of  $\pm 0.03"$  ( $\pm 0.08$  cm)

## 6.0 Reference Drawings

The following diagrams show the unit dimensions, mounting locations, and connector locations for the VSS-1616-02-x.

